

Abstract

Synthetic protein copolymers with plastic and elastic properties, and methods producing the copolymers, are provided. For example, a BAB triblock copolymer comprises a hydrophilic block and one or more hydrophobic blocks. The mechanical properties of a gel, fiber, fiber network, or film form of the copolymer are varied by one or more conditions before or after copolymer production. For example, a copolymer sequence can be varied before production, and one or more processing conditions such as solvent, pH, or temperature can be varied after production.